

Table X.

**Residential, Commercial and Industrial Technical Work Group
Summary List of Recommended High Priority Mitigation Options**

Note to TWG members: The eleven policy option description templates that follow correspond to the 11 RCI options identified as high priority for further elaboration by the TWG during its call of June 18. Included in this document, in the text for options RCI-1 through RCI-4 and RCI-8, is text (and in some cases, comments) provided by TWG volunteers, which is presented in **yellow highlights**. Please note that in some cases this text is the work of several volunteers working together, and in others it represents the work of one TWG member thus far. In all cases, however, it is intended to be a starting point for review and modification by consensus by the full TWG, and ultimately, by the CAT. Text in ***italics within the yellow highlights*** is text provisionally added or modified by CCS to adapt volunteer text to the templates.

As in the previous version of this document, the templates text for each option that was NOT prepared by volunteers since the 7/12 volunteer call remains derived from entries in existing Washington RCI documents corresponding to the chosen options, including the Catalog of Options and the Options Summaries, plus comments and other materials received from TWG members. Plain text included in the policy option templates represents input by TWG and CAT members, either during calls or by e-mail. Text in [*bracketed italics*] is generic text from the Catalog and Options Summaries documents that is provided for reference only, and can be used, revised, or replaced as the TWG deems appropriate. Some comments have been edited and summarized for succinctness and to avoid duplication; if you find that any key submitted comments are missing, please let David, Carrie, or Michael know ASAP. Note that these are working drafts that will be continuously expanded and elaborated by TWG members.

Following the Drafting Volunteers Conference Call of July 12, we have amended the list of Drafting Volunteers to include TWG members (and appointees) who have opted to work on additional options. Also noted are “point persons” for RCI-1 through -4, which will be the initial focus of volunteer work. Due to the overlap in both the types of improvements targeted and the volunteer groups for RCI-2 and RCI-3, it was decided during the July 12 call that these options would be worked on by the two groups combined, at least initially, with the point persons for those groups sharing point responsibility.

#	Mitigation Option Name	Preliminary List of Drafting Volunteers (point persons for options denoted with underline and an asterisk*)
RCI-1	Demand-Side Management (DSM) Energy Efficiency Programs, Funds, or Goals for Natural Gas, Propane, and Fuel Oil (originally 1.2)	Ash Awad, Bert Gregory, <u>Bob Stolarski</u> * (PSE, for Cal Shirley)

#	Mitigation Option Name	Preliminary List of Drafting Volunteers (point persons for options denoted with underline and an asterisk*)
RCI-2	Targeted Financial Incentives and Instruments to Encourage Energy Efficiency Improvements (Business Energy Tax Credit and Private/Public Efficiency Funds) (originally 1.3 and 1.5)	<u>Ash Awad*</u> , Nancy Hirsh, Bert Gregory, Sara Kendall and/or Anthony Chavez
RCI-3	Promotion and Incentives for Improved Community Planning and Improved Design and Construction (e.g. LEED, NAHB, Green Globes, Architecture 2030, and other guidelines) in the Private Sector (originally 2.2 and 2.4)	Bert Gregory, Sara Kendall and/or <u>Anthony Chavez*</u> (Edie Sonne-Hall of Weyerhaeuser may assist in areas of overlap with Forestry options), Gregg Carrington (provisional), Amanda Eichel
RCI-4	Energy Efficiency Improvement in Existing Buildings, with Emphasis on Building Operations (originally 2.6)	Ash Awad, <u>Nancy Hirsh*</u> , Amanda Eichel
RCI-5	Rate structures and Technologies to Promote Reduced GHG Emissions (including Decoupling of Utility Sales and Revenues) (originally 5.3)	Amanda Eichel
RCI-6	Provide Incentives to Promote and Reduction of Barriers to Implementation of Renewable Energy Systems (originally 6.1)	John Ryan (through Energy Supply)
RCI-7	Provide Incentives and Resources to Promote and Reduction of Barriers to Implementation of Combined Heat and Power (CHP, or “cogeneration”) and Waste Heat Capture, Including Net-metering for Combined Heat and Power (originally 6.2 and 5.2)	John Ryan (through Energy Supply), Bob Stolarski
RCI-8	Consumer Education Programs, Including Labeling of Embodied Life-cycle Energy and Carbon Content of Products and Buildings (originally 4.1 and 8.2)	<u>Mo McBroom*</u> , Anthony Chavez (Edie Sonne-Hall of Weyerhaeuser may assist in areas of overlap with Forestry options) (Bert Gregory has provided input)
RCI-9	Identify GHG Emissions Impacts and Measures to Avoid, Minimize, or Mitigate them for Projects Requiring Government Review, and in Designing Government Rules and Regulations (originally 7.7 and 7.8)	Mo McBroom

#	Mitigation Option Name	Preliminary List of Drafting Volunteers (point persons for options denoted with underline and an asterisk*)
RCI-10	More Stringent Appliance/Equipment/Lighting Efficiency Standards, and Appliance and Lighting Product Recycling and Design (originally 3.1 and 8.1)	Mo McBroom
RCI-11	Policies and/or Programs Specifically Targeting Non-energy GHG Emissions (originally 7.4)	

RCI-1. Demand-Side Management (DSM) Energy Efficiency Programs, Funds, or Goals for Natural Gas, Propane, and Fuel Oil

Based on RCI Catalog Option 1.2

Mitigation Option Description

This policy is designed to increase the investment in natural gas, propane (or liquefied petroleum gas—LPG), and fuel oil demand-side management programs. These DSM activities shall be designed to work in tandem with other strategies recommended by the CAT that also encourage efficiency gains.

Mitigation Option Design

In order to implement DSM programs for these fuel sources, a number of mechanisms could be considered, many of which are in place for electrical DSM programs and others being considered by the CAT. Candidate mechanisms include revising existing statutes to enable investments in energy efficiency and to consider potentially eligible programs that are cost-effective taking into account the valuation of for CO₂ emissions.

Potential elements of this option could include:

- I-937-like requirements for gas utilities to acquire all cost effective conservation; Initiative 937 requires that “Each qualifying [electric] utility shall pursue all available conservation that is cost-effective, reliable, and feasible.”
- For propane and fuel oil, a surcharge and/or incentive to fund DSM activities.
- A program such as Oregon’s Business Energy Tax Credits system, which could be a useful tool to make more efficient use of natural gas, propane, and fuel oil.
- Requirements for high volume transportation gas customers to install efficiency measures.
- Low-cost loans for efficiency improvements, performance contracting.
- Implementation/administration of efficiency programs by utility (including municipal utilities and cooperatives), state agency, or third-party actors.
- Subsidized energy audits for homeowners, businesses, industries, energy end-use surveys, consumer education.
- Incentives for customer-sited renewable electricity and heat including solar photovoltaic (PV), passive solar space heat, and solar water heat (SWH).
- Incentives for specific technologies, potential including (but not limited to) white roofs/rooftop gardens/ landscaping, ground-source heat pumps, lighting, water heating, plug loads, networked personal computer management, power supplies, motors, pumps,

boilers, customer-side transformers, water use reduction, **appliance recycling/pick-up programs** and others.

- Energy efficiency reinvestment funds to provide funding for efficiency improvements in specific sectors.
- Focus on specific market segments (low income residential, small and medium businesses).
- Incentives to convert fossil fuel based heating systems to biomass based heating systems, while also increasing the overall system efficiency.
- Incentives to convert fossil fuel based energy generation systems to renewable based energy generation systems.
- Incentives for combined heat and power systems at the regional, neighborhood, or building level, which may be combined with incentives for the use of renewable energy.
- **Goals:** Specific savings goals would be developed and dependant on the dual [?] source and the savings potential analysis
- **Timing:** The wide variety of potential implementation mechanisms would result in various implementation schedules
- **Coverage of parties:** All parties currently involved in energy policy, regulation and implementation plus the providers and users of these fuel sources.
- **Other:**

Implementation Mechanisms

Analysis of DSM potential should *be prepared to assist in directing* legislative and regulatory processes to set targets and fund programs.

Related Policies/Programs in Place

Integrated Resource Planning

In 2006, the Washington Legislature passed the Electric Utility Planning Act (ESHB 1010), requiring each consumer-owned or investor-owned electric utility, with more than 25,000 customers, to develop or update an integrated resource plan by September 2008. All plans are reviewed by CTED and must include an assessment of conservation and efficiency resources, an evaluation of renewable and nonrenewable generation, and recommendations for development of new policies and programs to obtain conservation and efficiency resources.

The Northwest Power and Conservation Council (NPCC) 5th Plan calls for reduction of 2,800 MW in electricity consumption through conservation in the next 20 years (through 2025) in the Northwest. WA State consumes about 50% of the energy in the Northwest (based on WA population compared to the rest of the region).

Type(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:** Total use by fuel type, average efficiency by end use, and upgrade potential needed to assess savings potential.
- **Quantification Methods:** Application of market factors such as user receptivity and energy management industry capacity will in part determine actual achievable potential.
- **Key Assumptions:** TBD

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:** As with the existing DSM efforts on the electric side, expanded efforts work create significant numbers of jobs throughout the market from manufacturing to installation.
- **Reduced Fuel Import Expenditures:** Unknown

Key Uncertainties

Uncertainties include the rate of development of the markets to achieve efficiency installations for these fuel sources, including the rate of acceptance by end users, and the development of training and education programs to expand the capacity of the energy management industry.

Additional Benefits and Costs

Replacing aging boiler systems will also provide the added benefit of creating safer buildings, and therefore decrease insurance costs. In schools statewide a focus on replacing aging boiler systems with new, more efficient systems will also lead to a better more consistent standard of comfort, therefore an improved physical learning environment.

Feasibility Issues

DSM activities on the electric side indicate that there are no significant barriers to achieving significant savings results

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-2. Targeted Financial Incentives and Instruments to Encourage Energy Efficiency Improvements (Business Energy Tax Credit and Private/Public Efficiency Funds)

Based on RCI Catalog Options 1.3 and 1.5

Mitigation Option Description

Targeted financial incentives and instruments, through **two primary vehicles 1)** a business energy tax credit and **2)** private/public efficiency funds, can be used as means of encouraging energy efficiency improvements **that will impact the development, design, and building of new and existing systems (to include both entire buildings and stand-alone systems).**

1. Business Energy Tax Credits can provide incentives for businesses to invest in energy efficiency and/or customer-sited renewable energy systems. Washington lacks an income tax, but has business and occupations taxes, typically on gross receipts, that apply to a number of different categories of businesses; a business energy tax credit would be applied to these taxes. **Applying these tax credits to both retrofit projects and new construction projects would be a goal.**

Energy Performance Contracting Sales Tax Exemption: Exempt from retail sales taxes (~6.5%) for those projects electing energy savings performance contracting services (RCW 39.35a) carried out on public buildings in the state, including schools, universities, community colleges, and state and local government buildings and energy savings performance contracting services in private buildings meeting the intent of RCW 39.35a.. In a retrofit project the system energy use is clearly defined and therefore the tax credits should apply to the overall project for those projects improving energy efficiency by a minimum of 20% over the building's existing energy performance.

Superior Energy Efficiency Sales Tax Exemption:

On new construction in public and private buildings, the tax credits would be targeted on the differential between the project costs for energy code rated systems versus those systems that exceed the collective energy efficiency of the building by 20% over that of the energy code in effect at the time, to 1% of the total project construction costs for those projects that exceed the collective energy efficiency by 50% over that of the energy code in effect at the time, and to 2% of the total project construction costs for those projects that are net-zero buildings, meaning that they consume no more energy than they produce.

The overarching intent of these tax credits would be to yield a nearly neutral revenue position for the State while reducing the use of fossil fuels and their climate change impact. Tax credits applied to energy efficiency or renewable energy **will** generate additional government revenues through increased local market activity and job creation, and through re-spending of energy cost savings.

Clean Technology Businesses B&O Credit

To compel job creation and the growth of clean technology businesses a B&O tax credit will be provided to those businesses that deliver energy efficiency related services, to include professional services, construction services, and highly efficient products. This B&O credit will be applied to those business revenues associated with those projects and systems that also qualify for the retail sales tax credit.

- 2. Public/Private Efficiency Funds**, would provide zero- or low- interest loans for energy efficiency applications in both retrofit and new construction.

The State of Washington Treasurers program does have both a COP and LOCAL loan program that provides tax-exempt financing to municipal and state entities. And many commercial financial institutions provide a variety of equipment and system tax-exempt and commercial grade lease-back options. Tax exempt interest, even at 4%, over a 10 year loan term reduces the possible energy efficiency project scope by up to 30%. Nearly 50% of the project scope is eliminated if commercial rates of 7.5% are used to finance energy efficiency projects. Therefore, a no-interest loan program would yield significantly more energy efficiency project scope since public and private organizations that choose to secure outside financing will be able to direct more funds at projects improving energy efficiency versus interest charges.

These loans would be used to fund the remaining portion of a project that is not addressed by utility rebates or a business energy tax credit. It is expected that this funding option would cover 30 to 70% of a total project costs. In new construction, this fund would only be applicable to the differential between the project costs for energy code rated systems versus those systems that exceed the collective energy efficiency of the building by 20% over that of the energy code in effect at the time.

For public entities the loan obligation could be guaranteed to be paid out of the annual energy savings through an energy savings performance contracting (ESPC) model. Legislation already exists that enables an ESPC delivery in existing building, and a minor modification to RCW 39.35a would allow for the use of ESPC in new construction projects and systems. There is national and international adoption of the ESPC model. For instance, through the Clinton Climate Initiative Energy Efficiency Building Retrofit Program (C40) an international effort is in motion to leverage ESPC programs with public/private funding to complete \$5 billion in energy efficiency work internationally. For private entities the loan obligation could also be paid out of the annual energy savings through direct owner payment, micro-utility, a public/private resource management association (RMA,) a condominium association, or the energy savings performance contracting (ESPC) model.

Mitigation Option Design

Business Energy Tax Credits:

CTED - Are there other State retail or B&O tax incentive models nationally to also include since the BETC focuses on income tax relief?

A business energy tax credit (BETC) scheme similar to the one being successfully implemented in Oregon would serve as a good model for Washington State.

The combined spending on the BETC and RETC (residential energy tax credit) programs for 2003 totaled \$30.9 million for tax credits and program administration. The effect of these tax credits combined with spending by businesses and residences taking advantage of these tax credits had the following net impacts on the Oregon economy in 2003:

- Output in Oregon's economy increased by \$42.5 million
- 182 new jobs were created in Oregon
- Oregon wages increased by \$8.6 million
- Tax revenues for state and local government increased by \$2.7 million
- Oregon commercial and residential energy costs decreased by \$27.9 million

From http://www.oregon.gov/ENERGY/CONS/docs/EcoNW_Study.pdf

In Oregon, the tax credit is 35 percent of the eligible project costs - the incremental cost of the system or equipment that is beyond standard practice. You take the credit over five years: 10 percent in the first and second years and 5 percent each year thereafter. If you can't take the full tax credit each year, you can carry the unused credit forward up to eight years. Those with eligible project costs of \$20,000 or less may take the tax credit in one year.

Trade, business or rental property owners who pay taxes for a business site in Oregon are eligible for the tax credit. The business, its partners or its shareholders may use the credit. The applicant must own or be the contract buyer of the project (the project owner). The business must use the equipment for the project or lease it for use at another site in Oregon. A project owner also can be an Oregon non-profit organization, tribe or public entity that partners with an Oregon business or resident who has an Oregon tax liability. This can be done using the Pass-through Option. Many projects qualify. They include: Conservation, Lighting, Recycling, Alternative Fuels, Hybrid Vehicles, Rental Dwelling Weatherization, Transportation, Efficient Truck Technology, Sustainable Building. The tax credit can cover all costs directly related to the project, including equipment cost, engineering and design fees, materials, supplies and installation costs.

Tax credits can apply to retrofits, new buildings, co-generation projects, and renewable resource projects.

Public/Private Efficiency Fund:

There are a number of schemes currently being implemented, which bring together public and private investment to encourage energy efficiency in new and old buildings. Most 'efficiency funds' are being implemented on the local/city level but could be adapted to Washington State. Taking parts of each of the schemes may be the best approach for a state-wide fund.

Using the Cambridge Energy Alliance as a model, form a independent non-profit that will assist residents, businesses and institutions and provide technical experts with figuring out what to do, finding the right people to do it and obtaining the funds to pay for energy efficiency programs, including low-interest loans that will be repaid out of documented energy savings. The fund could apply to retrofits, but also to new construction to help market driven projects achieve significantly higher levels of energy efficiency than the market will currently support. This organization could have a roster of banks that have bought into the idea that can provide low

interest loans for energy efficient strategies and can be paid back through the energy savings provided by the loan (as in the case of the Clinton Climate Initiative Energy Efficiency Retrofit program). As with both the CEA and the Toronto Atmospheric Fund, start-up money for an organization of this type could come from private sources or the sale of state owned land.

- **Goals:**
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

Government tax credits and not for profit independent organizations.

Related Policies/Programs in Place

In 2005, the Washington legislature enacted the Renewable Energy System Cost Recovery (RCW 82.16.110) and Tax on Manufactures or Wholesalers of Solar Energy Systems.

Type(s) of GHG Reductions

This initiative would yield GHG reductions from energy efficient buildings and systems both in electric and fossil fuel usage. The following provides a perspective on the amount of energy efficiency to be gained through these initiatives.

[CCS Note: Typically this section of the template is used for a generic, qualitative description of the types of GHG reductions available from the option. Quantitative estimates of option cost and savings are typically presented in the template section that follows]

The combination of these two financial incentives could yield [\$1.1] billion of highly efficient projects through 2020, presuming these financial mechanisms are in place starting in 2009. For every \$100 M of projects that occur on an annual basis due to these financial incentives it is assumed that with an average simple payback of 10 years there would be \$10 M per year of avoided energy costs. It is presumed based on typical project profiles that 50% of the energy saved would be related to natural gas, fuel oil, or propane and 50% would be related to electric energy. For basic math it is presumed that fossil fuel energy costs [\$XX/BTU] and electric energy costs [\$XX/BTU]. This leads to [XXXXXXX] BTU of fossil fuel savings and XXXXXX of BTU of electric energy savings annually. These savings could be expected to be yielded on a nearly even basis statewide.

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

[Ash note: This is my wild start to providing thoughts and some math on the next two sections. Lot's of guesstimating and holes that need to be filled. Hoping that SEI, CTED, IGC, et al, could help with filling in the numbers based on statewide averages or other means that may be being used in the creation of other TWG initiatives. Your edits and input is needed.]

[CCS Note: The initial volunteer estimates and thoughts below on savings and costs of this option are expected to be augmented and elaborated over the coming months by CCS, working closely with the TWG]

Based on [XXXXXX BTU] of fossil fuel and [XXXXXX] electricity savings annually it would be expected that these initiative would yield the following GHG reductions from 2009 to 2020, with a majority of the reductions coming over the first 5 years based on the sheer opportunity statewide.

(Need to add GHG reduction math here.)

As noted above [\$1.1 billion] of highly efficient projects and system work will be completed with these initiatives through 2020. And although [\$1.1] billion of projects will be completed the business tax impact would be approximately 8%, or \$60 to \$100 million. While the public/private funding program will only offset the interest associate of no more than 70% of the total projects, or \$700 million, which would yield a cost of approximately \$150 to \$200 million. Therefore the total cost of these initiatives would be as low as \$210 million to \$300 million. The cost per MtCO₂e would be [\$X.X].

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
 - Provide financing strategies beyond what the private sector market will support today for long-term benefits
- **Job Creation:** Ash Note: Can CTED or NWenergy help with this one? I recall some ratios of jobs to efficiency dollars spent.
- **Reduced Fuel Import Expenditures:** again could use some support here.

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

- Consider impact on government revenues and stimulation of economy though market creation.

Feasibility Issues

The business tax exemption faces the typical challenges related to issuing a tax break, however since this initiative would generate projects, save energy costs in public facilities, and create jobs it is expect that a fiscal note (looking at all factors, not just lost tax revenue) would yield a positive economic impact to the State.

Feasibility issues might lie in the public/private funding initiative that relies on public money to support private investments. This issue would need to be worked through appropriately. Important key element of this is to create mechanisms that allow payment of loans in both retrofit and new construction through the savings from energy efficiency for both public and private entities. Also, to make sure that Washington state law allows condominium associations

and other entities to guarantee the loan, as well as allowing the formation of resource management associations, ESPC, and micro-utilities at the project level.

It will be important to set the correct improvement benchmark to receive the economic incentive benefits. Having a sliding scale for greater efficiency will be very useful.

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-3. Promotion and Incentives for Improved Community Planning and Improved Design and Construction (e.g. LEED, NAHB, Green Globes, Architecture 2030, and other guidelines) in the Private Sector

Based on RCI Catalog Options 2.2 and 2.4

Mitigation Option Description

[This policy provides incentives and targets to induce the owners and developers of new and existing buildings to improve the efficiency with which energy and other resources are used in those buildings, along with provisions for raising targets periodically and providing resources to building industry professionals to help achieve the desired building performance. This policy can include elements to encourage the improvement and review of energy use goals over time, and to encourage flexibility in contracting arrangements to encourage integrated energy- and resource efficient design and construction.] Several design standards exist that can be drawn upon to promote improved design, including LEED¹, Architecture 2030², National Association of Home Builders (NAHB) Green Home Building Guidelines³, Built Green⁴, Green Globes⁵, Sustainable Forestry Initiative⁶ (SFI), and the recognition of the use of CSA-⁷ and FSC-certified⁸ wood in construction. This policy could also include consideration of the concepts of embodied energy and “renewability” of building materials.

Residential and commercial construction result in a significant percentage of greenhouse gas (GHG) emissions in Washington State. Construction in residential and industrial sectors contributed roughly 20% of Washington’s GHG emissions in 2005. As such, it is recommended that goals require all new construction, both residential and commercial, to achieve higher energy efficiency standards in the near future. (ie: 2020 or 2030). The efficiency standards should take into account all the energy required in the entire building process, including the amount of energy needed to make building materials. This will produce an accurate GHG number by which builders can look to improve upon.

[Improved community planning⁹ aims to create communities that are, among other attributes, livable, designed for reduced use of energy both within homes and businesses and in the transport sector, and have a reduced environmental impact relative to typical developments. Variants on the smart growth concept exist, but many call for clustering living units with easy access (often walking distance) to shops, schools, and entertainment and recreational facilities,

¹ <http://www.usgbc.org>.

² <http://www.architecture2030.org/home.html>

³ <http://www.nahbrc.org/greenguidelines/>

⁴ <http://www.builtgreen.net/checklists.html>

⁵ <http://www.greenglobes.com/fitup/Non-Flash/index.htm>

⁶ <http://www.sfiprogram.org/>

⁷ http://www.csa-international.org/product_areas/forest_products_marking/program_overview/

⁸ <http://www.fsc.org/en/>

⁹ See, for example, http://www.epa.gov/smartgrowth/about_sg.htm for additional information about Smart Growth.

incorporating elements of energy efficient design and renewable energy in buildings, sharing energy facilities between buildings (for example, district heating systems), and preserving open spaces.]

Like construction of buildings and facilities themselves, land use decisions have a significant impact on regional and statewide greenhouse gas emission profiles. Research in California, NYC and elsewhere has begun to quantify this impact. California estimates 10-15% of potential statewide reductions can be achieved through land use planning changes. New York City is estimating 15.6 million metric tons will be reduced through smart growth planning and design (accounting to approximately 30% of *their* total reduction strategy). Efficient community planning holds perhaps the greatest potential for future reductions of any mitigation strategy.

[Comment from Volunteer member: “I believe that we need to have the factual basis to support these recommendations. For example, some of my questions are: (1) are these practical solutions (have they all been implemented elsewhere)? (2) If so, how much do they cost the consumer? (3) Is there a way of ranking these based on how much they would cost to implement versus how much energy they save? If we don't have the answer to these questions, can we ask that they be evaluated?”]

Mitigation Option Design

- **Goals:**
 - Percentage of GHG reductions should be consistent with the Governor’s goals *[A VOLUNTEER COMMENT SUGGESTS THAT THIS GOAL NEEDS TO BE FURTHER DEFINED]*.
 - Expand the use of climate friendly products in building materials.
 - As possible goals for this option, consider going beyond LEED to Architecture 2030-level goals, providing energy consumption performance (energy intensity) that is 50% of the regional average for each building type.
 - Explicitly identify the link between GHG reductions and land use planning decisions as well as the reduction potential and target(s) for Washington state (this is a category more easily measured on a regional or statewide basis than at the local government level because it includes things like “avoided sprawl” which has statewide reduction impact but may result in increased density (and emissions) locally).
- **Timing:** As stated above, the timing of the goals should track the goals set by the Governor’s Executive Order.
- **Coverage of parties:** All builders, building material suppliers, recycled building material sellers, and home improvement stores. The aforementioned should be considered for both private and public construction projects.
- **Other:**

Implementation Mechanisms

Potential implementation elements of this option could include: *[Some of this text from the previous version of the option, but moved from the “Policy Design” section by volunteers]*

For general incentives and promotion:

- Create a tax incentive for new energy efficient commercial and residential buildings, as well as new master planned communities, using Oregon as a model. To maximize effectiveness, tax incentives should target cutting-edge, very high-efficiency technologies or practices that customers might not find otherwise. The incentives should be large enough to affect decision-making, while reporting requirements should be just stringent enough to make fraud insignificant.
- Tie state economic development funding to meeting a LEED – NC gold with minimum energy and water criteria for buildings, or LEED - ND gold requirement in the private sector, for communities with minimum energy, water and location criteria. **(Note: As stated above, it is important to point out that several design standards exist that can be drawn upon to promote improved design, including LEED¹⁰, Architecture 2030¹¹, National Association of Home Builders (NAHB) Green Home Building Guidelines¹², and Green Globes, however at this point only LEED has attempted to prioritize credits with direct climate impact and establish GHG reduction goals for certified buildings)¹³**
- Encourage state agencies to utilize the LEED rating system or the Green Globe rating system to promote the construction and design of energy-efficient buildings.
- Provide tax credits for construction of a green building or rehabilitation of an existing structure to green building standards.
- The state could provide incentives that encourage and promote the use of climate friendly products in both commercial and residential buildings and building materials.
- Create incentives to encourage smart growth and support GMA by meeting a LEED-ND gold level, with minimum energy and location criteria.
- Implement policies that encourage utilities to make renewable energy more widely available.
- Increase and extend the tax credit for PV, biomass and wind that are mandated in SR 5101 to meet the standards of other states.

For consideration of life-cycle emissions:

- Consideration of concepts of embodied energy in and “renewability” of building materials¹⁴
- Include embodied energy/carbon footprint/life cycle assessment information for building materials in green building standards, such as LEED, NAHB, or Green Globes.

¹⁰ <http://www.usgbc.org>.

¹¹ <http://www.architecture2030.org/home.html>

¹² <http://www.nahbrc.org/greenguidelines/>

¹³ <http://www.usgbc.org/News/PressReleaseDetails.aspx?ID=2941>

¹⁴ See, for example, CORRIM (Consortium for Research on Renewable Industrial Materials), Life Cycle Environmental Performance of Renewable Building Materials in the Context of Residential Construction, available from http://www.corrim.org/reports/2005/final_report/index.htm.

- Targeting reduction of emissions from diesel engines used in new construction developments.
- A business assistance program to help identify and achieve GHG goals and life-cycle cost analysis of buildings and building components.
- Measures to reduce urban “heat island” effects through integrated strategies, including - green roofs, white roofs, plantings.
- Include carbon footprint information/literature on materials in building supply and home improvement stores.

For education training:

- Training and certification of building professionals.
- Consumer and primary/secondary education.
- Increasing private sector education and incentives to promote high performance green buildings.
- Incentives for building operator certification.

For tools and standards:

- Setting up of a clearinghouse for information on and access to software tools to calculate the impacts of energy efficiency and solar technologies for buildings.
- Private standards for green building and sustainable forest management (e.g. SFI, CSA, PEFC, FSC) encouraged through promotions and incentives.
- Setting a cap on consumption of energy per unit area of floor space for new buildings.

Potential elements for improved community planning could include:

- Improved planning to reduce sprawl modeled after efforts by the Center for Clean Air Policy¹⁵, the state of California, and the Institute for Local Government¹⁶ including the “California Communities Climate Action Plan” and the “California Green Community” rating tool.
- Conditioning of approval of hook-ups to city, county and utility services upon GHG emissions reduction plans.
- Administrative changes to enhance integrated design of communities and transport systems.
- Consideration of location as part of a building’s GHG “footprint”.

¹⁵ <http://www.ccap.org/>

¹⁶ <http://www.cacities.org/index.jsp?zone=ilsg>

- Reinforcement of the importance of Growth Management and conservation easements linked to Transfer of Development Rights.
- Implementing or adjusting hookup fees for new developments to provide incentives for smart growth.
- Moving from a State Dept. of Transportation to a State Department of Urban, Rural, and Regional Mobility.
- Establishing a State Department of Urban Design.
- Disbursement of transportation funds should be tied to collaborative planning at a regional level.
- State should utilize key leverage points to push smart land use planning approaches: SEPA, housing elements, etc.
- Require that all projects requiring government review identify GHG emission impacts and reduction options: Require that SEPA reviews quantify GHG emissions and identify measures to avoid, minimize or mitigate emissions for projects requiring government review.
- Add climate protection as a required element of local planning under the state Growth Management Act.
- Facilitate a coordinated long-range local government planning process to better coordinate land use, transportation and economic development.
- Consider restricting financial and technical assistance to priority growth areas (see Maryland).
- Participate in multi-state efforts to qualify and quantify the impacts of land use on energy and environmental systems.

Related Policies/Programs in Place

LEED

Executive Order 05-01, directs the adoption of green building practices in the construction of new or renovated existing state buildings (>25,000 ft²), as well as mandates a 10% reduction in State Agency energy purchases from 2003 levels by September 1, 2009 and LEED silver standards for WA public buildings.

High-Performance Public Buildings bill (Chapter 39.35D RCW), requires all new state-funded facilities over 5,000 sq. ft. to meet green building standards. Major office and higher education facility projects will be required to achieve the US Green Building Council Leadership in Energy and Environmental Design rating standards (referred to as LEED™ Silver certification). New K-12 schools will be required to meet the Washington Sustainable Schools Protocol (WSSP) or LEED certification. The Department of General Administration's Sustainable Design and Construction program oversees the construction or reconstruction of state and state funded facilities built to LEED standards. The Department of Community, Trade, and Economic Development is required to adopt sustainable building standards by July 1, 2008. The legislature prioritized the use of locally extracted and manufactured products in all state building projects.

LEED requirements do not apply to affordable housing projects that receive state funding,

Several local governments offer [LEED Incentive Programs](#). The City of Seattle's LEED Incentive program offers incentives to commercial projects based on LEED certification level achieved. Seattle's Built Green Incentive program assists with green residential single and multi-family projects. There are several tax incentives available in Washington State for solar and renewable energy products, which can be incorporated into green buildings.

Ecology's Solid Waste and Financial Assistance Program is actively involved in promoting Green Building (GB) by training architects, builders, and lenders on Green Building and working with governments, communities, schools, commercial and residential sectors on GB initiatives. Some of the activities include:

- Working with some counties to adopt GB in Solid Waste Plans.
- Maintaining the Website developed at Ecology.

[Note that the following lines were suggested to be deleted by a volunteer member from this section, and has been moved to the "data sources" section. Is this an active WA program that should remain in this section?:

Smart Growth

Smart Growth Strategy for the 21st Century (<http://smartgrowth.wa.gov> CTED)]

Type(s) of GHG Reductions

- Significant reductions could be achieved by substituting more energy intensive building materials with building materials that rely on less energy and therefore, produce far fewer GHG emissions. Recommendations in this area should consider full life cycle impact, including energy required to condition/operate space following occupancy (e.g. buildings constructed of low intensity building materials may require more energy to condition based on thermal massing potential, etc.).
- Reduction of GHG emissions from avoided electricity production and avoided on-site fuel combustion. (language from New Mexico state process)
- "Avoided Sprawl" has significant regional reduction potential.

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:**

Improved Design & Construction:

- Buchanan, A.H. and S.B. Levine. 1999. Wood-based building materials and atmospheric carbon emissions. *Environmental Science and Policy*. 2: 427-437.
- Eriksson, P.E. 2003. *Comparative LCA:s for wood construction and other construction methods- Energy use and GHG emissions*. A study compile on behalf of the Swedish Wood Association, now part of Swedish Forest Industries Federation, Stockholm. <http://www.Svensktra.org/pub/lca.pdf> (accessed Feb 28, 2007).

- Miner, R. 2006. The 100-year method for forecasting carbon sequestration in forest products in use. *Mitigation and Adaptation Strategies for Global Change*. Published online 20 May 2006. Springerlink.
- Perez-Garcia, J., B. Lippke, D. Briggs, J. Wilson, J. Bowyer, and J. Meil. 2005. The environmental performance of renewable building materials in the context of residential construction. *Wood and Fiber Science* 37 CORRIM Special Issue: 3-17.
- Thormark, C. 2006. The effect of material choice on the total energy need and recycling potential of a building. *Building and Environment* 41:1019-1026.
- U.S. Department of Energy. 2006. Forestry Appendix to Final Technical Guidelines for Voluntary Reporting of Greenhouse Gas Program, 1605(b).

Improved Community Planning:

- "The Role of Land Use in Meeting California's Energy and Climate Change Goals."
- Smart Growth Strategy for the 21st Century (<http://smartgrowth.wa.gov> CTED)
- **Quantification Methods:** Methods and protocols for measuring and reporting emissions and sequestration are adopted that are in harmony with nationally and/or internationally developed methods and protocols (such as the WRI/WBCSD *Greenhouse Gas Protocol*), which promote accuracy, transparency, and are cost-effective.
- **Key Assumptions:**
 - Public and Private building is factored into the GHG reduction goals that are being proposed.
 - Commercial Green building is defined as one that meets LEED silver standard or at least a Two Globe rating according to the Green Building Initiative's Green Globes rating system. *[Volunteer Comment: This is a broad assumption without clear climate implications – e.g. under current rating systems, a LEED silver building is not necessarily a climate friendly building. Same could be said for Green Globes.]*
 - The prevailing standard for residential construction is the NAHB Green Home Building Guidelines *[Volunteer Comment: If we are going to make assumptions about rating systems, we should be careful to highlight those credits within systems with the most direct climate impact. It's not just about using a rating system, it's actually about GHG reduction if we're to claim green building as a true climate mitigation strategy.]*

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
 - Would have a significant impact on GHG emissions reduction over the long term
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-4. Energy Efficiency Improvement in Existing Buildings, with Emphasis on Building Operations

Based on RCI Catalog Option 2.6

Mitigation Option Description

Existing buildings will continue to use the bulk of the energy used in the residential and commercial sectors in Washington for many years. This option would promote and provide incentives for the improvement of the energy efficiency of the existing building stock. Key to reducing energy use and GHG emissions in existing buildings are building operations, maintenance, and occupant behavior (for example, via total resource management systems).

Mitigation Option Design

Potential elements of this option could include:

- Promoting retro-commissioning and BOC in all facilities of large portfolio organizations.
- Supporting code enforcement, retro-commissioning, and building operator certification for resale upgrade ideas and support for energy efficiency lending.
- Encouraging free market economy functions that achieve performance standards rather than imposing specific types of costs.
- Commercial benchmarking and Retro- Commissioning consistent with 2030 Challenge baseline work.
- Focusing on building operations, maintenance, and occupant behavior.
- Requirements for upgrading the energy efficiency of buildings at the time of resale
- A requirement that a full time resource conservation manager be located on the premises of all medium to large business or agency.
- **Goals:**
 - Propose energy performance metrics that help define and communicate energy use and environmental impact
 - Identify systems that can accelerate savings and lower cost of implementation
 - Reduce energy use in existing residential, commercial and industrial building stock by an average of 50% in near term, with long term target of carbon neutrality.
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

Promote retro-commissioning and BOC in all facilities of large portfolio organizations:

- Require benchmarking and commissioning whenever buildings are financed or refinanced.
- Require utilities to establish comprehensive program to promote and facilitate retro-commissioning of existing buildings, in particular regular inspections of boilers and air conditioning systems
- Voluntary lighting upgrades supported by state technical assistance (see

Focus on building operations, maintenance, and occupant behavior:

- Provide consumers with real-time information on their energy consumption: incentivize in-home displays (concept of an energy “dashboard” or “speedometer”) of energy use, energy costs, carbon consumption, water use, etc., and include context, e.g., how are you doing compared to your neighbors. Couple with information on products/services available for investment
- Job development and career training: one constraint to deep energy savings is the lack of trained professionals and trades people that can provide solutions and implement strategies. There is a need for additional educational and training opportunities aimed at the construction industry.
- Consider a ban or requirement to eliminate inefficient lighting fixtures (San Francisco is considering an ordinance to eliminate all existing T-12 lighting within City limits; California is considering a ban on sale of incandescent light bulbs)
- Conduct a state-wide campaign aimed at encouraging behavioral changes. Models in California (e.g. Flex Your Power) have had significant success at reducing statewide residential energy demand.

Requirements for upgrading the energy efficiency of buildings at the time of resale

- Establish minimum energy performance standards and/or cap energy budgets at the time of sale.
- Establish (or facilitate by opening up legal pathway) point of sale and point of rental requirements for energy efficiency audits and upgrades. Models developed by Berkeley, San Francisco and Oakland; and Austin.
- Provide assistance to affordable housing to meet same.

Secure commitment of state and local government entities to undertake energy efficiency upgrades and operational changes in government owned and operated facilities as a first step in moving the market.

Related Policies/Programs in Place

LEED requirements apply to some remodeled building, see RCI-3.

LEED-EB applicable to the existing commercial building stock and provides a good guideline for achieving operational savings.

Type(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:**

- ACI Summit: Moving Existing Homes Toward Carbon Neutrality:
 - Industry Stakeholder Recommendations for DOE's RD&D for Increasing Energy Efficiency in Existing Homes (http://www.affordablecomfort.org/images/Uploads/f_ind_stake_recommendations.pdf)
 - Whole-House Energy Analysis Procedures for Existing Homes (http://www.affordablecomfort.org/images/Events/30/E_WholeHouseEnergyAnalysis.pdf)
 - Existing Homes Target Market Assessment (http://www.affordablecomfort.org/images/Events/30/B_marketreportdoemod.pdf)
 - US Residential energy expenditure (http://www.affordablecomfort.org/images/Events/30/C_US_Residential_energy_expenditure.pdf)
- UNEP, "Buildings and Climate Change: Status, Challenges and Opportunities." (http://www.uneptie.org/pc/sbc/documents/Buildings_and_climate_change.pdf)
- Summary and Recommendations of the *Getting to Fifty* Summit (http://www.newbuildings.org/gtf/documents/GT50_Summit_Final_Report.pdf)
- Options for Energy Efficiency in Existing Buildings (<http://www.energy.ca.gov/2005publications/CEC-400-2005-039/CEC-400-2005-039-CMF.PDF>)

- **Quantification Methods:**

- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-5. Rate structures and Technologies to Promote Reduced GHG Emissions (including Decoupling of Utility Sales and Revenues)

Based on RCI Catalog Option 5.3

Mitigation Option Description

[This option could include various elements of utility rate design that are geared toward reducing greenhouse gas emissions, often with other benefits as well, such as reducing peak power demand. The overall goal is to revise rate structures so as to better reflect the actual economic and environmental costs of producing and delivering electricity as those costs vary by time of day, day of the week, season, or from year to year. In this way, rates provide consumers with information reflecting the impacts of their consumption choices.]

Mitigation Option Design

Potential elements of this option could include:

- Modifying policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments. Programs could be based on efforts in this area through the National Action Plan for Energy Efficiency¹⁷, the ACEEE Report: Aligning Utility Interests with Energy Efficiency Objectives¹⁸, and related program models in California and Oregon.
- Different types of rate structures and bases for rate structures, including rates based on the number of occupants of a home rather than its size.
- Programs that consider the interaction of green building programs and rate structures.
- Focusing on demand response strategies such as direct load control and pricing.
- *[Rate structures and utility cost recovery rules that “decouple” the level of utility sales from the net revenues earned by utilities. Decoupling mechanisms have been implemented or are under consideration in a number of western states. (Note: PSE is not pursuing decoupling at this time.)]*
- *Time-of-use rates, which typically price electricity higher at times of higher power demand, and thus better reflect the actual cost of generation. Time-of-use rates may or may not have a significant impact on total GHG emissions, but do affect on-peak power demand and thus both the need for peaking capacity and fuel for peaking plants. Take into account Puget Sound Energy experience in piloting time of use rates.*
- *Tiered (increasing block) rates for electricity and natural gas use, which provide affordable base usage rates for consumers, but which increase with increasing consumption.*

¹⁷ <http://www.epa.gov/cleanrgy/actionplan/eeactionplan.htm>

¹⁸ <http://www.aceee.org/pubs/u061.htm>

- *“Smart metering”—implementation of consumer meters showing real-time pricing, and the level of GHG emissions related to consumption at any given time. Smart meters are described as providing consumers with the information needed to make consumption choices, and can include the capability for consumers to adjust the type of power (for example, “green” versus conventional power) “on the fly”.]*
- **Goals:**
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

[Insert text here]

Related Policies/Programs in Place

In 2006, the Legislature passed the net metering law (HB 2352 - amending Chapter 80.60 RCW). The law directs large electric utilities to:

“... offer to make net metering available to eligible customers-generators on a first-come, first-served basis until the cumulative generating capacity of net metering systems equals 0.25 percent of the utility's peak demand during 1996. On January 1, 2014, the cumulative generating capacity available to net metering systems will equal 0.5 percent of the utility's peak demand during 1996. Not less than one-half of the utility's 1996 peak demand available for net metering systems shall be reserved for the cumulative generating capacity attributable to net metering systems that generate renewable energy.”

Type(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD